Claims

What is claimed is:

1. A method for dielectric pattering comprising:

providing a conductive polymer surface;

positioning a mask over the polymer surface; and

radiating the polymer surface in presence of hydrogen to form positive hydrogen ions that interact with exposed portions of the polymer surface to form a dielectric pattern.

2. The method of claim 1, further comprising positioning the mask in substantial proximity to the polymer surface to mitigate presence of the hydrogen ions in areas covered by the mask.

3. The method of claim 1, radiating the polymer surface further comprising radiating *via* an x-ray source so as to etch the dielectric pattern.

4. The method of claim 1, radiating the polymer surface further comprising radiating *via* a UV ray source.

5. The method of claim 1, radiating the polymer surface further comprising radiating *via* a wave length of less than 300 nm.

6. The method of claim 1, further comprising providing gaseous medium comprising hydrogen and an inert gas.

7. The method of claim 1, further comprising etching portions of the dielectric.

8. A dielectric patterning system, comprising:

means for covering portions of a conductive polymer surface; and

means for radiating the conductive polymer surface in presence of hydrogen to form a dielectric pattern on uncovered portions of the conductive polymer surface.

9. A method for fabricating a memory cell comprising:

forming an organic polymer layer over a conductive layer, the conductive layer serving as a bit line;

positioning a mask over the organic polymer layer;

radiating the polymer surface in presence of hydrogen to form positive hydrogen ions that interact with exposed portions of the polymer surface and form a dielectric on the polymer surface, and

forming an electrode layer over the polymer layer with dielectric patterning.

10. The method of claim 9, forming an organic polymer layer further comprises forming at least one layer from the group consisting essentially of: polyacetylene (cis or trans), polyphenylacetylene (cis or trans), polydiphenylacetylene, polyaniline, poly(p-phenylene vinylene), polythiophene, polyporphyrins, porphyrinic macrocycles, thiol derivatized polyporphyrins, polymetallocenes, polyferrocenes, polyphthalocyanines, polyvinylenes, polypyrroles and polydiphenylacetylene.

11. The method of claim 9, forming the electrode layer further comprises forming at least one layer from the group consisting essentially of: amorphous carbon, tantalum, tantalum nitride (TaN), titanium and titanium nitride (TiN).

12. The method of claim 9, further comprising, forming a conductivity facilitating layer over the conductive layer.

13. The method of claim 9, further comprising employing at least one of spin-on techniques, sputtering techniques, growth techniques, deposition techniques, physical vapor deposition (PVD), chemical vapor deposition (CVD), low pressure chemical vapor

deposition (LPCVD), plasma enhanced chemical vapor deposition (PECVD), high density chemical vapor deposition (HDCVD), rapid thermal chemical vapor deposition (RTCVD), metal organic chemical vapor deposition (MOCVD) and pulsed laser deposition (PLD).

14. The method of claim 9, forming the organic polymer further comprises forming a layer with a thickness within a range between about 100 Å to 1500 Å.

15. The method of claim 9 further comprising:

measuring at least on of the thickness, rate, composition location and density of the dielectric pattern being formed; and

selectively controlling in response to the measurements at least one of pressure within the chamber, temperature within the chamber, concentration of gases within the chamber, rate of flow of gases into the chamber, volume of gases distributed into the chamber and excitation provided within the chamber.

16. The method of claim 15 further comprising taking measurements *via* at least one of optical interference, scatterometry, IR spectroscopy, ellipsometry, scanning electron microscopy, synchrotron and x-ray diffraction based techniques.

17. The method of claim 15 further comprising:

mapping the wafer into one or more grids; and

obtaining measurements at the grid mapped locations.

18. A system that forms a dielectric pattern on a polymer surface comprising:

a component that forms a mask that covers selected portion of the polymer surface; and

a radiation source that radiates a polymer surface in presence of hydrogen so that portions of the polymer surface not covered by the mask form dielectric material.

19. The system of claim 18, the beam being an X-ray.

20. The system of claim 18, the beam being a UV.

21. The system of claim 18, the polymer is organic.

22. The system of claim 18 further comprising:

a gas distribution system that provides hydrogen and an inert a gas into a chamber;

a temperature system that regulates the temperature within the chamber; and

a pressure system that regulates the pressure within the chamber.

23. The system of claim 22 further comprising:

a measurement system that monitors formation of the dielectric material over the polymer surface; and

a control system electrically coupled to at least one of the measurement system, gas distribution system, radiation source, temperature system and pressure system, the control system obtaining readings taken by the measurement and selectively adjusting at least one of the gas distribution system, radiation source, temperature system and pressure system in response thereto to facilitate at least one of formation of the dielectric pattern to a desired thickness, formation of the dielectric pattern at a desired rate, formation of the dielectric pattern to a desired composition, formation of the dielectric pattern to a desired density, and formation of the dielectric pattern at a desired location of the conductive polymer not covered by the mask.